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ABSTRACT

To assess the long-term impacts of adult literacy programs, the Center for Literacy Studies conducted the Longitudinal Study of Adult Literacy Participants in Tennessee from 1991-95. The study focused on changes in the lives of 450 participants in the domains of work, family, and community after they enrolled in literacy programs. Participants from three cohorts (1991-92, 1992-93, 1993-94) were enrolled at literacy Level One, and their initial scores on the Adult Basic Learning Exam reading test were below the sixth-grade level. Follow-up studies were administered annually through 1995, although the number of participants who could be located diminished each year. Results were analyzed from the responses of 199 adults from the 3 cohorts who took part in a follow-up interview approximately 1 year after their initial enrollment. The 116 questions dealt with employment, literacy practices, involvement with children's schooling, community awareness, self-esteem, and life satisfaction. Participants reported positive change on at least one item in each category, including a higher rate of employment, increased self-esteem, increased involvement in community organizations, and increases in some uses of literacy. Data showed no significant changes in community awareness or in how people felt about their community; no greater likelihood of attending community meetings or talking about politics; no significant increase in reading or in involvement in children's education; and few significant changes in life satisfaction. (Contains 16 references.) (YLB)

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NCSALL

National Center for the Study of Adult Learning and Literacy

CHANGES IN LEARNERS' LIVES ONE YEAR AFTER ENROLLMENT IN LITERACY PROGRAMS

An analysis from the Longitudinal Study of Adult Literacy Participants in Tennessee

by

Mary Beth Bingman,
Olga Ebert, and Michael Smith
Center for Literacy Studies, University of Tennessee, Knoxville

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EXECUTIVE SUMMARY

What changes occur in the lives of adult learners when they participate in literacy programs? The outcomes of participation in adult literacy programs have typically been measured in terms of gains on standardized tests and/or passing the General Educational Development (GED) exam. The other positive changes occurring in students' lives, especially those outside the classroom, generally are not assessed, perhaps because they are difficult to track and to measure. A recent longitudinal study of adult literacy learners in Tennessee found a variety of outcomes in learners' lives, including an increased rate of employment, increased self-esteem, and increased community participation. Perhaps, rather than taking workforce preparation as an isolated objective, adult basic education needs to be seen as a process through which participants gain skills and confidence enabling them to be truly productive members of the modern society, as workers, citizens, and family members.

In an effort to assess the long-term impacts of adult literacy programs, the Center for Literacy Studies (CLS) conducted the Longitudinal Study of Adult Literacy Participants in Tennessee from 1991-1995. The purpose of the study was to identify if and how participation in literacy programs impacted the lives of adults. The study focused on changes in the lives of 450 participants in the domains of work, family, and community after they enrolled in literacy programs. The participants from three cohorts (1991-92, 1992-93, and 1993-94) were enrolled at literacy Level One, and their initial scores on the ABLE (Adult Basic Learning Exam) reading test were below the sixth-grade level. Follow-up surveys were administered annually through 1995, although the number of participants who could be located diminished each year. Two interim reports were published by the Center for Literacy Studies in 1993 and 1994 (Merrifield, Smith, Rea, Shriver, 1993 and Merrifield, Smith, Rea, Crosse, 1994).

This final report examines the responses of the 199 adults from the three cohorts who took part in a follow-up interview approximately one year after their initial enrollment. Results reported here are based on their responses to 116 questions dealing with employment, literacy practices, involvement with children's schooling, community awareness, self-esteem, and life satisfaction.

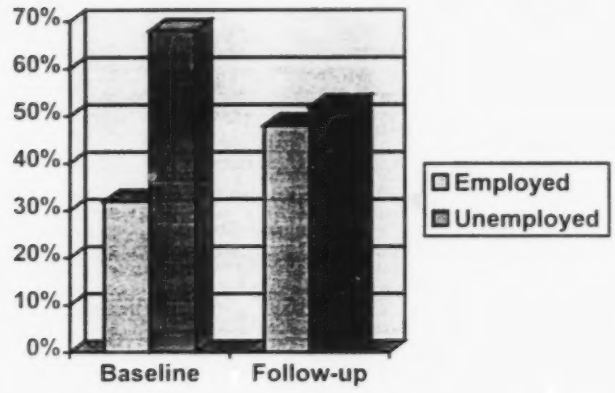
Two research questions were addressed in this analysis: What aspects of life change one year after enrollment in an ABE (Adult Basic Education) program? Will substantial participation in an ABE program produce more change in various aspects of life than limited participation in an ABE Program?

After one year, participants in the study reported positive change on at least one item in each of the categories examined by this study: employment, self-esteem, community, and children's education. There was no control group in this study, and so one cannot say that these changes were a result of participation in an adult literacy class. But the changes were greater than would be expected by chance, and the common variable among the participants (in addition to being Tennessee adults) was enrolling approximately one year earlier in an adult literacy program.

The changes these adults reported one year after enrollment included a higher rate of employment, increased self-esteem, increased involvement in community organizations, and increases in some uses of literacy.

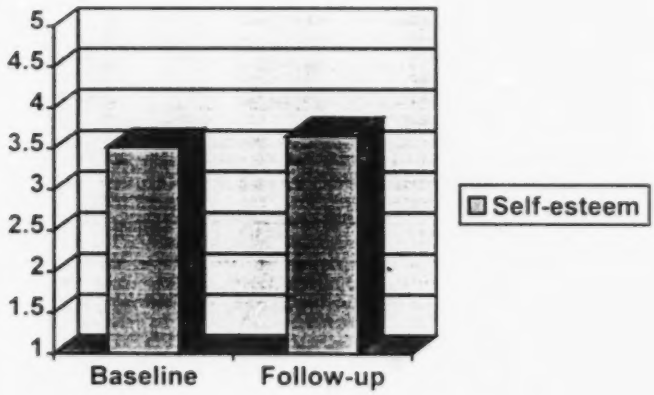
- An increase in rate of employment from 32% to 48%.

Graph 1: Increase in Employment Rate



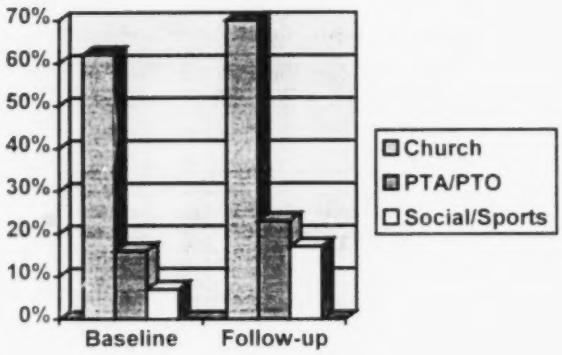
- An overall increase in self-esteem (as measured by the Rosenberg Self-Esteem Scale) from 3.52 to 3.66 on a 5-point scale ($p<.01$).

Graph 2: Increase in Self-Esteem



- Increased involvement in community (religious, parent-teacher association, social/sports) organizations ($p<.05$).

Graph 3: Increase in Community Involvement



Other positive changes found were:

- Positive changes in 3 of 8 literacy practices examined (paying bills, working with numbers on the job, needing to memorize because of limited reading ability) ($p<.05$).
- Increase in number of people who thought a book was a good gift for a child ($p<.05$).
- An increased overall satisfaction with their financial situation in Cohorts 2 and 3 ($p<.05$).

As this data shows, after participation in adult basic education, even for a short time, the adult learners in this study reported improvements in some areas of their lives. There were, however, no significant changes in community awareness or in how people felt about their community. People were not more likely to attend community meetings or talk about politics. There was not a significant increase in reading reported, nor a significant increase in involvement in children's education. There were few significant changes in life satisfaction.

The analysis for this report also compared the 32% of the group with substantial participation (at least 80 hours of class since enrollment) with the 68% with limited participation (fewer than 80 hours). There were few significant differences between those with limited hours of classroom time and those who had substantial participation. Those with substantial participation did, however, report significantly more satisfaction with their family life than those with fewer than 80 hours. Those with substantial participation were more likely to say that a book is a good gift for a child. On the other hand, those with limited participation were more likely than those with substantial participation to report a decrease in the need to memorize because they couldn't read well. Also, 18.5%

more of those with limited participation were employed after a year while 12% more of those with substantial participation were employed.

What do these findings mean for adult basic education? The analysis reported here supports the conclusion that participation in adult basic education is a positive factor in regard to employment. It supports the often-reported (Beder, 1991; Beder, 1999) conclusion that participation in adult basic education leads to increased self-esteem. Detailed information on the programs is not available; however, qualitative interviews with participants in seven of the programs describe programs where the teachers were very supportive and the curriculum was primarily structured around basic skills acquisition and practice (Bingman & Ebert, in press).

There are multiple variables impacting both employment and self-esteem, but taking the step to enroll in an adult education program, even one without a specific workforce focus, may have led to increased self-esteem and to taking the additional step of seeking employment. This suggests that while a focus on work-force preparedness might strengthen employment outcomes, programs that focus more on basic skills development also support employment outcomes.

The study also suggests that information about the curricula and instructional approaches of the programs in which adult literacy students participate are needed to really understand what factors contribute to outcomes or lack of outcomes in learners' lives. Without an understanding of program content, outcomes studies can inform adult educators about changes in learners' lives, but do not indicate what program modifications might improve outcomes.

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Acknowledgments

This project developed out of the Longitudinal Study conducted by the Center for Literacy Studies in 1991-1995 and was funded by the Office of Adult and Continuing Education of the Tennessee Department of Education. We are grateful to our CLS colleagues, particularly to Donal Crosse, who provided valuable assistance in collecting earlier study materials. We also appreciate the help of several former interviewers and ABE supervisors from the counties that participated in the Longitudinal Study whose names are not mentioned here for the reasons of confidentiality.

Reviewers for this study were Don Dessart from the University of Tennessee, Knoxville, and Tom Valentine from the University of Georgia, Athens. Tom Valentine and Hal Beder from Rutgers University have both served as consultants at earlier stages of the project. John Comings has also offered valuable comments.

We appreciate contributions of all of the above to the quality of this report. All the errors should be attributed solely to the authors.

Introduction

The outcomes of participation in literacy programs for adults have typically been measured in terms of gains on standardized tests and/or passing the General Educational Development (GED) exam. The other changes occurring in students' lives, especially changes that occur outside the classroom are generally not assessed, although these may be the areas where outcomes are most significant. These potentially important results, however, are difficult to track and to measure. The National Center for the Study of Adult Learning and Literacy (NCSALL) is currently involved in several projects, including this report, that focus on assessment of real-life outcomes of participation in literacy programs. This report continues analysis of the Longitudinal Study of Adult Literacy Participants in Tennessee, originally funded by the Tennessee Office of Adult and Continuing Education.

The longitudinal study was conducted by the Center for Literacy Studies (CLS) in 1991-1995. It has been characterized by Beder (1998) as "one of the most ambitious state studies, and had its ambitions been realized, it might have been the best state study yet conducted" (p. 48). The study focused on changes in participants' lives in the domains of work, family, and community after they enrolled in literacy programs. All the participants enrolled at literacy Level One which means that their scores on the ABLE (Adult Basic Learning Exam) reading test were below the sixth grade level. The study purposes were described by Merrifield, Smith, Rea, & Crosse (1994) as follows:

> The overall goal of the Longitudinal Study of Adult Literacy Participants in Tennessee is to assess the long-term impacts of adult literacy programs on the quality of life of participants. Our interest is not so much in whether participating adults gain skills, but in the question, "What difference does literacy education make in the lives of individuals?" (p. 1)

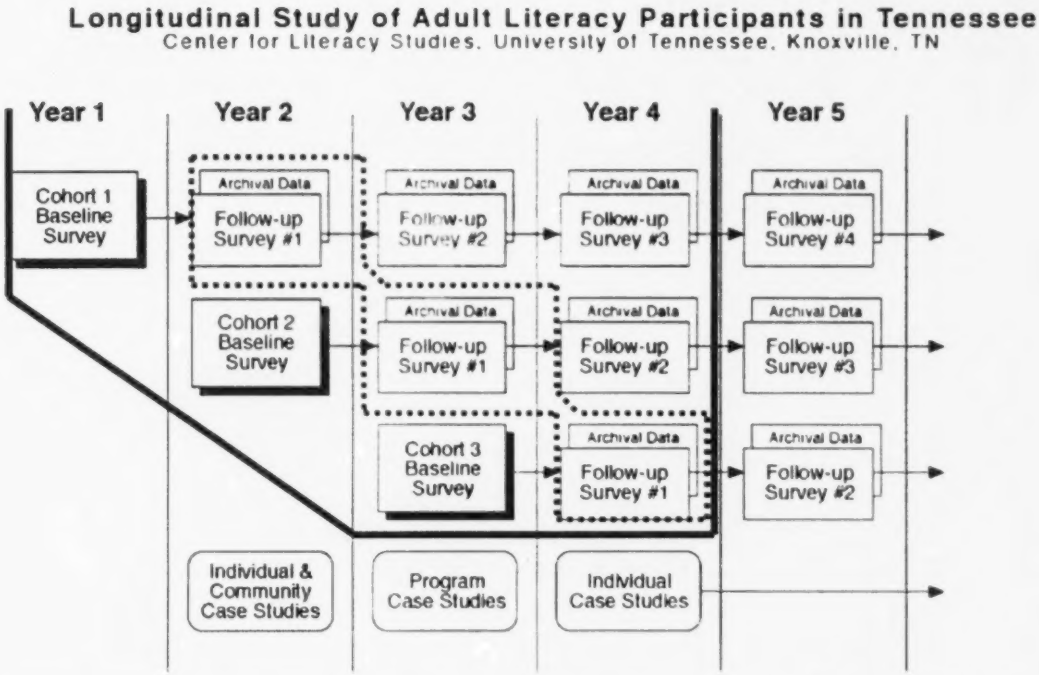
The primary objective of the study was to expand understanding of how participation in literacy programs changes adults' quality of life, with a focus on four main areas:

- socio-economic well-being (jobs, income, survival)
- social well-being (family and community life)
- personal well-being (self esteem, life satisfaction)
- physical well-being (health and access to health care)

The study was designed to continue for five years and include qualitative (individual, program, and community case studies), as well as quantitative data.

The following figure outlines the proposed activities for the five years of the project.

Figure 1: Original Design of the Study



_____ outlines the part of the study completed in 1991-1995 (Years 2-4).
..... outlines data sets from the three cohorts that constitute the total N of 199 participants in this report.

However, funding was interrupted and the study was not completed. Only three reports were published (Year One, Merrifield, Smith, Rea, & Shriver (1993) and Year Two, Merrifield, Smith, Rea, & Crosse (1994)). The Year One report gave a detailed description of the methodology and design of the study, and contained demographic and baseline data for Cohort One. The Year Two report examined change. Its major component was analysis of the first round of follow-up interviews with Cohort One, conducted a year to eighteen months after baseline interviews. The report also described the baseline data on Cohort Two and compared the baseline data for Cohort One and Cohort Two. This was a technical report, designed to report in depth on the data and the analyses conducted. It was followed later in 1994 by a summary report designed to highlight the major findings with implications for policy and practice (Merrifield, Smith, Crosse, & Rea, 1994). For Year Three, data were collected and analyzed

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but there was no report published. During Year Four only some of the data were collected. No program or community case studies were published, although some information was collected and processed for program case studies. [1]

When the Center for Literacy Studies became NCSALL's partner in 1996, its researchers returned to the Longitudinal Study. This decision was made because a final analysis and report of the Longitudinal Study's abundant data was considered important for better understanding of adult literacy students and the changes in their lives after participation in literacy programs. Due to the limited number of Follow-up Two (N=84) and Follow-up Three (N=35) interviews, the analysis for this report only includes data from Follow-up One interviews from the combined three cohorts (N=199). The present report contains the findings related to changes in participants' responses to questions dealing with their employment, literacy practices, involvement with children's schooling, community awareness, self-esteem, and life satisfaction one year after enrollment in Adult Basic Education (ABE).

Methodology

Site Selection

Eight ABE Level-1 programs from across the 95 counties of the state of Tennessee were selected as sites for the study. Site selection was conducted with the aid of a demographer from the University of Tennessee and with input from the Tennessee Division of Adult and Community Education, and the Tennessee Department of Education. A paired comparison method was used to select the sites (Lieberson and Silverman, 1965): this method enabled a sample of counties to be drawn, which was as representative as possible of other counties in a particular area. The research team selected six demographic variables for the study (percent non-white, percent families living in poverty, percent population change, percent adult high school graduates, percent urban, and median years of education completed). The counties were coded and sorted by the three major regions of the state (east, middle, west), and within each region, by rural and urban (yielding six sets of counties), and means for each of the variables were calculated for each of the six sets of counties. Counties with the most variables falling within a half standard deviation from the means were selected as possible sites. Next, the numbers of ABE Level One students at each potential site were collected from state reports, the goal being to have a sample of 240 Level One students in each of five areas: East Tennessee urban, East Tennessee rural, Middle Tennessee rural, West Tennessee urban and West Tennessee rural. In fact, only four primarily urban counties had at least this number of Level One

[1] The Learner-Identified Impacts Study, funded by NCSALL, has since collected qualitative data on ten Longitudinal Study participants.

students during the previous year. As a result, some smaller counties were combined. Eight research sites were thus identified, to which the ninth site was added in Year Two in order to increase the sample size from Middle Tennessee.

Participant Selection

The process of participant selection is described in the Year One report as follows:

> In order to qualify for the study, students in these ABE-1 programs had to be new entrants (that is, not enrolled in the program in the previous year). They also had to score at or below 5.9 on the reading components of the Adult Basic Learning Exam (ABLE) test, mandated for use in all ABE programs in Tennessee. The State of Tennessee classified students as Level One if they scored at or below 5.9 on either the reading or the math components of ABLE, but it was felt that for the purposes of this study reading level was the more important qualification. We recognize, however, the flawed nature of reading tests. This was brought home by one participant in the study who passed his GED test a few months after testing at 2.8 on the ABLE (Merrifield et al., 1993, p. 16).

A total of 450 baseline interviews were completed in the nine sites participating in the study in Years One, Two, and Three. The table below presents the number of interviews for each year of the study (the sample for this report is shown in bold letters).

Table 1: Tennessee Longitudinal Study Interviews

	Cohort 1	Cohort 2	Cohort 3	Total
Baseline	133	149	168	450
Follow-up 1	**70**	**64**	**65**	**199**
Follow-up 2	45	39		84
Follow-up 3	35			35

Survey Administration

At each site, interviewers were trained by CLS staff to administer the questionnaires to new students. Interviewers consisted of ABE coordinators, supervisors, teachers, administrative assistants, and VISTA volunteers. Interviewers were instructed to interview in person as many of the new students

who qualified as possible (although the final selection of whom to include was left to the program). The participants were informed about the goals and design of the study and were paid a nominal stipend for each interview. Telephone interviews were deemed inappropriate for this constituency, as many ABE students do not have phones. Mail surveys would likewise be inappropriate for people reading at low levels.

The baseline interviews were to be completed within the new students' first 30 days in the program in order to collect data before changes could occur. At the end of each month, interviewers mailed their completed questionnaires to the Center for Literacy Studies. The questionnaires were then checked, processed, coded, and entered into the computer database. Quality control checks were conducted by telephone by Center for Literacy Studies staff on ten percent of completed questionnaires in order to verify accuracy of completed surveys.

Unlike the baseline interviews, the Follow-up interviews were not always conducted by ABE program staff. In some sites, particularly the smaller rural communities, ABE program staff did track down and interview the study participants. In other sites, CLS identified and trained other interviewers. Almost all the interviews were conducted in person, but nine were conducted by phone when it proved difficult to contact the person directly. Of the people who could not be reached, some had moved with no forwarding address, others refused to be interviewed, or had moved out of state, and a few were in jail, hospitalized, or deceased (Merrifield et al., 1993 and 1994).

Instrumentation

In the design of the questionnaire, the research team consulted the literature on participation in ABE and related outcomes studies. Three focus groups were also conducted with students active in ABE-1 programs. The focus groups provided information about the actual experiences of program participants. The draft questionnaire was reviewed by experienced researchers in adult education, political science, sociology and psychology, and by several ABE practitioners. The questionnaire was then piloted with ABE participants in five programs in different areas of the state and modified for clarity and ease of administration.

Questions on the survey instrument addressed four major areas of quality of life:

- socio-economic well-being
- social well-being
- personal well-being
- physical well-being

To examine socio-economic well-being, respondents were asked about their employment and sources of income, as well as about other activities used to make ends meet. Social well-being was examined through questions relating to family and community involvement. The personal well-being of respondents was examined with questions pertaining to self-esteem and lifestyle. The Rosenberg Self-Esteem Scale, used to examine self-esteem, was selected in part because it has been widely used with different populations and in part because it is one of the shorter self-esteem instruments. To examine physical well-being, students were asked about their health and access to health care. In addition to these major areas, respondents were asked general demographic questions about their age, marital status, number of children, etc.

The follow-up questionnaires include many of the same questions as the baseline questionnaire, with some new ones asking people to reflect on changes in their lives. The follow-up questionnaires were revised at the end of each year for two research reasons: 1) to incorporate additional questions in order to test newer hypotheses generated by the researchers, and 2) to delete questions that participants had difficulty completing. Furthermore, the final questionnaire was shortened to reduce the time of administration.

Limitations of the Study

There are several limitations of this research (both the original longitudinal study and the final analysis) of which the reader should be aware:

- First, the sample sizes are small, and learner attrition over time resulted in further decrease in sample sizes. For this report, all three cohorts were combined. Limitations of sample size are noted throughout the analysis when they affected a finding.

- Secondly, the sample was not fully representative of ABE literacy students in Tennessee. It was subject to biases, some known and some unknown. The original Cohort One baseline demographics were consistent with those known at the time for all ABE Level One students in Tennessee with one notable exception: this Cohort over-represents African-Americans. Statewide, 29 percent of ABE-1 students in 1991-92 were black. In our Cohort One, 58 percent were black; however, in the group followed-up, 47 percent were black. Overall, out of all the 450 participants interviewed at the baseline, 49% were black, and out of the 199 for whom Follow-up interviews were available, 38% were black. Another discrepancy was age-related: in Tennessee ABE, 42% of students at the time were in the age group 16-24, but out of 450 baseline participants, only 26% were in this group, and among the participants for whom a follow-up interview was available, only 18% were in this group.

- Thirdly, there were several problems in the process of selecting and interviewing participants. In Cohort One, in particular, one large urban site biased their sample by not interviewing students who entered by referral from the Department of Human Services (thus under-representing people who are unemployed). Another program did not interview students coming to the night classes (thus under-representing people who are employed). Because of staffing shortages most programs did not include everyone who qualified for the study, lowering the sample size. Some people refused to be interviewed, although that was not a substantial number. Most of these issues were addressed for Cohorts Two and Three, for which an additional research site was added, boosting the sample size in Middle Tennessee.

- There was not a comparison group in our study. It was beyond the means of the research team to obtain a representative sample of adults who would be eligible for the study but did not enroll in ABE. By dividing participants into two subgroups, those with less than 80 hours of instruction, and those with 80 or more hours of instruction, we were able to compare outcomes for those who enrolled but did not participate substantially in the ABE program, with outcomes for those who spent a substantial number of hours in instruction. This comparison may be valuable because the two groups were similar in the sense that both took a step to change their lives: both enrolled in an educational program, and both may be motivated to make other changes in their lives as well. But we expected the group who substantially participated in classes to be more likely to have made significant skill gains.

- One issue that particularly affected the study is that not everyone who was interviewed for the baseline agreed to be part of the follow-up. For example, the total baseline interviews for Cohort One were 133, but only 101 of these participants agreed to take part in the Follow-up. Most of the refusals for follow-up came from one research site, Memphis, and since it is urban and has a higher African-American population than the other areas, these Memphis refusals changed the demographics of the group. In this analysis of change, comparisons are made only for participants with the baseline and follow-up data.

- Although in the original design, the time period between the baseline and follow-up data was to be 12 months, in reality, it varied between 12 and 20 months.

- Finally, all the data in the study were self-reported. In any such study, researchers have to assume that people told the truth as best they knew it. In some cases they may have wanted to present themselves in the best possible

light. In some cases they may have wanted to obscure personal information. These limitations must be borne in mind as the findings are reviewed.

Analyses for the Present Report

Follow-up One Participation

Four hundred and fifty adults completed the baseline interviews over a three-year period (Cohorts 1, 2 and 3). Of these 450, 199 completed the first follow-up questionnaire. For purposes of this research report, this sample of 199 will be used to discuss aspects of change over a one-year period.

Comparison Questions

There were three versions of the baseline questionnaire, each modified slightly from year to year to accommodate new research hypotheses. There were also three versions of the follow-up questionnaire. Version three of the follow-up questionnaire contained the fewest items, in part to shorten the interview process and perhaps to encourage more participation.

For this research report, only common questions found on each of the three follow-up interviews were used for analysis, with minor exceptions. This process enables the entire sample size of 199 to be used for many of the comparisons, thus increasing the power of any statistical tests that were performed. Furthermore, only items relevant to specific research questions are discussed in the text of this report.

These questions, common to all the questionnaires and grouped by category, are as follows:

- ***Work*** *– four items pertaining to participants' employment and their perceptions about current jobs*

  Are you employed right now, either full-time or part-time?

  I am satisfied with my present job.
  I have a lot of responsibility at work.
  With my present skill level, I have no chance for promotion.

- *Rosenberg* ***Self-Esteem*** *Assessment – a slightly modified version of a popular instrument*

  A ten-item measure of self-esteem

- ***Community*** – *eight items about participants' community awareness, five items about their involvement in various community activities/organizations, and one item about voting*

  My community does not have good quality public schools.
  My neighborhood is a safe place to live.
  I am satisfied with my community.
  I worry about environmental problems.
  I am more interested in what goes on in my own community than in the rest of the world.
  I feel full of hope about the future.
  As a citizen I can help bring about needed change in government.
  Public officials don't show enough concern for ordinary people.

  How active are you in the following organizations?
  - Church or synagogue
  - Parent-Teacher Association/Organization
  - Social or Sports Group

  How often do you attend community meetings?
  How often do you talk politics with friends and family?

  Are you a registered voter?

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- ***Literacy Practice*** – *two items pertaining to participants' literacy-related problems, and seven items about actual literacy practices at home and at work*

How often do you need to memorize things because you can't read well enough?
How often do you have problems understanding rules and regulations at work?

How often do you use the public library?
How often do you read magazines, newspapers, or books?
How often do you read books to your children?
How often do you pay bills yourself?
How often do you need to write on the job?
How often do you need to work with numbers on the job?
How often do you need to read to get your work done?

- ***Family Life/Children*** – *six items about participants' involvement with their children's schooling and education*

In the last month, how often have you helped the children in your home with their school work?

How often have you talked with them about school in the last month?

How often in the past year have you visited or called teachers about the progress of children in your home?

How many school activities, other than sports, have you attended in the last year?

How often do you tell your children stories?

A book is a good gift for a child.

- ***Life Satisfaction*** *– 13-item scale based on the Set of Domain Satisfactions that has been developed by Campbell, Converse, and Rodgers (1976), and slightly modified for the present study. The instrument is designed to measure participants' satisfaction with main areas of everyday life.*

Ratings of satisfaction on the following areas:

Your house or apartment
The city or neighborhood where you live
Our national government
Your non-working activities, hobbies, etc.
Your religion
Organizations you belong to
Your family life
Your friendships
Your health/physical condition
Your financial situation
Your life in general
Your work
Your marriage

ABE Participation

The ABE Programs were instructed to collect data on the number of instructional hours that participants had completed during that year in the program. This variable will be termed "Participation." Data for only 189 of the 199 participants was available. Thus, for comparisons involving the Participation variable, a maximum sample size of 189 will be used.

Participants were divided into two groups based on the following hours of instruction during their enrollment in programs: (1) **Limited Participation**: less than 80 hours of instruction; and (2) **Substantial Participation**: 80 or more hours of instruction. The dividing point of 80 hours was also used in the previous two longitudinal study reports. The Limited Participation group included 129 or 68% of all 199 participants, while the Substantial Participation group consisted of 60 or 32% of the participants.

Substantial participation	80 or more instructional hours	60 participants (32%)
Limited participation	Less than 80 instructional hours	129 participants (68%)

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Research Questions

The following section of this report presents two analyses of change for the participants in this study. First, comparisons for all participants are made between responses on the baseline questionnaire and the follow-up questionnaire. The research questions are as follows:

- **What aspects of life change after a one-year association with an ABE Program?** More specifically, what aspects of employment, self-esteem, community involvement, family life with children, literacy practices, and life satisfaction have changed (either positively or negatively) after one year?

  Two different statistical tests were used to answer this research question. A *chi-square analysis* was used in situations where variables at both baseline and follow-up were measured at the categorical level (such as gender and marital status). A chi-square analysis examines the numerical values behind certain percentages to ascertain if differences can be attributed to some other factor. A note that reads $p<.05$ indicates that there is a significant difference between baseline and follow-up, given a .05 or 5% chance of error. The notation, *n.s.*, for non-significant, indicates that there is no essential difference between baseline and follow-up values. For continuous variables (that is, those variables for which statistics such as means can be calculated), a *t-test statistical analysis* can be performed. For most of the results that follow, participants responded to a continuous variable at the baseline (such as answering a question on a rating scale) and again to the same question at the follow-up. A dependent t-test analysis was conducted for comparisons between means on baseline and follow-up. This analysis compares the absolute mean difference between baseline and follow-up participants on a particular question, adjusted for sampling error (that is, fluctuation due to sample size and variance). In the following tables, a note that reads *n.s.* stands for non-significant and indicates that baseline and follow-up means are essentially identical; that is, no change has occurred between baseline and follow-up. A note that reads $p < .05$ indicates that there is a significant difference between baseline and follow-up means, given a .05 or 5% chance of error. The sample size for these comparisons between baseline and follow-up was 199, unless otherwise noted.

- Second, comparisons between the baseline and follow-up responses were tabulated separately for those in the two Participation groups. This research question is as follows: **Will substantial participation in an ABE Program produce more change in various aspects of life than limited participation in ABE Programs?** Once again, comparisons will be made in the following

areas: employment, self-esteem, community involvement, family life with children, literacy practices, and life satisfaction.

To answer the second research question, a more complicated statistical analysis is required. For this hypothesis, means between the baseline and follow-up were averaged separately for the two participation groups, limited and substantial. Thus, the limited participation group has a mean at baseline and follow-up, as does the substantial participation group. A *2 x 2 repeated measures mixed design ANOVA* (analysis of variance) was conducted, using Participation as the between variable and Baseline/Follow-up as the repeated measure.

This research question focuses on whether substantial participation produces more change from baseline to follow-up than does limited participation. Consequently, the only statistical results that will be reported are interaction effects. An interaction effect occurs when the change in means from baseline to follow-up is dependent on the participation group. For example, on a particular variable, the averages for the limited participation group could have changed only slightly from baseline to follow-up, while the averages for the substantial participation group could have changed much more drastically. In this case, involvement in the participation group is interacting with the overall change from baseline to follow-up, producing more change in one group than another. In the tables that follow, an interaction effect will be noted as *Interaction*, with a corresponding probability level. The note, *n.s.*, indicates that there is no significant interaction.

The maximum sample size for the first research question is 199, while the maximum sample size for the second research question is 189 (data on instructional hours were not available for ten participants). All statistical tests utilized an error rate of 5% ($p<.05$) for testing research questions.[2] The results where error rate fell between 5% and 10% ($p<0.1$) were reported as marginally significant.

Findings

Demographics

The sample of participants for this study is not unlike other adult literacy students enrolled in Tennessee programs and Tennesseans in general. Table 2 summarizes several demographic variables for the state of Tennessee (based on the data from the 1990 population census), for the Tennessee Adult Basic

[2] For more information about quantitative research methodology, see article by T. Valentine, "Understanding Quantitative Research about Adult Literacy," in NCSALL periodical, *Focus on Basics*, vol. 1, issue A, Feb'1997.

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Education students (based on the Tennessee Department of Education statistical rollup for 1996-97), for the 450 Longitudinal Study participants for whom a baseline interview was available, and for the 199 participants, for whom both baseline and follow-up interviews were available.

In addition, we also wanted to know if participants who agreed to participate in the Follow-up One interview were representative of the participants at baseline. To answer this question, chi-square analyses were conducted on the number of participants at baseline and follow-up broken down by various demographic variables. In Table 2, these numbers are presented in bold. Looking at the gender distribution in Table 2, at baseline 48% of participants were male and 52% were female. If our Follow-up One participants were representative of this baseline group, we should expect equivalent numbers of males and females in this group. At Follow-up One 43% were male and 57% were female, percentages which are close to the expected values of the baseline. These slight differences in percentages are due to chance factors (chi-square =1.83, which is non-significant [n.s.] at the $p < .05$ level). Follow-up One participants were similar to the baseline on the following factors: gender, marital status, grade completed, and employment status. There were differences between the two groups on the following factors: age (slightly older participants agreed to be interviewed in the follow-up); race (more white than black participants volunteered for the follow-up); and urban/rural breakdown (more follow-up participants were from rural areas than urban areas).

Table 2: Demographic Data for Tennessee, TN ABE Students, All Longitudinal Study Participants, and the Participants with Both Baseline and Follow-Up Data

Demographic variables	Tennessee population (based on the 1990 census data) (N = 4,877,185)	Tennessee ABE students (based on 1996 data from the Office of Adult and Continuing Education) (N = 53488)	**Participants at baseline (1991-1993) (N = 450)**	**Participants at baseline for whom follow-up one data were available (N = 199)**	**Significance test results**
Gender:					**Chi-square**
male	48%	36%	**48%**	**43%**	**n.s**
female	52%	64%	**52%**	**57%**	
Age					**Chi-square**
16-24	14%	42%	**26%**	**18%**	**p<.05**
25-44	32%	43%	**52%**	**57%**	
45+	54%	15%	**22%**	**25%**	
Race					**Chi-square**
white	83%	67%	**49%**	**60%**	**p<.05**
black	16%	25%	**49%**	**38%**	
other	1%	8%	**2%**	**2%**	
Marital Status	Not available	Not available			**Chi-square**
married			**40%**	**46%**	**n.s.**
not married			**60%**	**54%**	
Grade completed:	Not available	Not available	**(mode: 9th)**	**(mode: 8th)**	**Chi-square**
less than 6th			**10%**	**12%**	**n.s.**
6th-9th			**48%**	**53%**	
10th-12th			**42%**	**35%**	
Site					**Chi-square**
Urban (four state metro areas)	40%	30%	**60%**	**47%**	**p<.05**
Rural/ small town	60%	70%	**40%**	**53%**	
Employment status					**Chi-square**
					n.s.
Unemployed	6.7% official unemployment rate	60%	**73%**	**68%**	
Employed		40%	**27%**	**32%**	

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A new variable was introduced in the analysis process for this report: whether participants had more or less than 80 hours of instruction in the ABE program, defined in Report 2 as "substantial participation rate" (p. 32). Among the 189 participants for whom information about instructional hours was available, 68% had less than 80 hours in the program (limited participation), and 32% had 80 or more hours (substantial participation). The demographic differences between these two groups are summarized in the following table:

Table 3: Demographic Data for Participants with Substantial and Limited Program Participation

Demographic variables	Participants with less than 80 instructional hours (N=129)	Participants with 80 or more instructional hours (N=60)	All participants (N=199)	Significance test results
Gender				
male	49%	32%	43%	Chi-square
female	51%	68%	57%	p<.05
Age				
16-24	22%	9%	18%	Chi-square
25-44	53%	63%	57%	n.s.
45+	25%	28%	25%	
Race				
White	69%	60%	60%	Chi-square
Black	29.5%	38%	38%	p<.05
other	1.5%	2%	2%	
Region				
East TN	62%	35%	53.5%	Chi-square
Middle TN	15.5%	15%	15.5%	p<.05
West TN	22.5%	50%	31%	
Grade completed			(mode: 8th)	Chi-square
less than 6th	10%	17%	12%	n.s.
6th-9th	52%	53%	53%	
10th-12th	38%	38%	35%	
Site				
Urban	46.5%	47%	47%	Chi-square
Rural	53.5%	53%	53%	n.s.

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How do participants differ demographically based on the number of instructional hours? There were no differences between the two groups on the following factors: age, grade completed, and urban/rural status. There were differences, however, in the following variables: gender (a higher percentage of females had 80 or more hours of instruction); race (a higher percentage of blacks had 80 or more hours of instruction); and region (participants from West Tennessee had the most instructional hours).

There were no differences between rural and urban programs in the percentage of participants with over 80 hours of instruction. However, there were regional differences: in West Tennessee (Memphis metropolitan area and surrounding mostly rural counties) 51% of participants had 80+, in Middle Tennessee (several small towns and rural areas), 31%, and in East Tennessee (urban area of Knoxville and several rural counties), only 21%. These differences, however, can probably be attributed to the number of weekly instructional hours offered by programs: Shelby County in West Tennessee, with a large proportion of the study participants, included the only sites at the time offering 16-20 hours per week, and the percentage of participants with 80+ hours in Shelby County was 94%. Another county in West Tennessee also offered some 20 hours-a-week classes, and the rate of 80+ participation in that county was 50%. All the other counties offered between two and nine instructional hours per week (usually 3-5), and their proportion of participants with 80 or more instructional hours was smaller. Since the majority of Black participants in the study came from West Tennessee, the regional and racial differences between participants who had 80 or more and less than eighty instructional hours are probably related. [3]

Research Comparisons

Two research questions were addressed in most of the subsequent analyses:

- What aspects of life change one year after enrollment in an ABE Program?
- Will substantial participation in an ABE Program produce more change in various aspects of life than limited participation in an ABE Program?

In this section of the report, the results of statistical analyses of baseline and follow-up questionnaires of 199 study participants are presented. All the findings below are based on the responses of the participants for whom baseline data and data one year after enrollment in literacy programs (Follow-up One) were available. Comparisons are made for the following categories: employment,

[3] Intensity of instruction and other program variables were not considered in the original study and so, were not included in the analysis for this report. However, eight out of nine programs had participants who had at least 80 instructional hours.

self-esteem, civic life, literacy practices, involvement with children's education, and life satisfaction.

Employment

One of the important results of this Longitudinal Study is that the percentage of those employed increased one year after enrollment in literacy programs. Literacy programs are increasingly expected to serve as workforce preparation agencies for people whose limited literacy skills might have prevented them from finding and retaining unsubsidized jobs. Substantial differences between baseline and Follow-up One data regarding employment status were found.

At the baseline, 32% of participants were employed, as compared with 48% one year after enrollment in a literacy program. There was 16% increase in employment rate of participants. The increase was more marked among people with fewer than 80 hours of participation (18.5%) than among those with 80 hours or more (12%). This difference (summarized in Table 4) suggests that some people left programs after relatively few instructional hours because they found employment.

Table 4: Participants' employment prior and one year after enrollment in adult literacy programs

Employment Status	All participants N=199	Those for whom # hours was available (N=189)	
		Those with fewer than 80 instructional hours	Those with 80+ instructional hours
% employed at baseline	32%	29.5%	38%
% employed at follow-up one	48%	48%	50%
Difference in % employed	+16%	+18.5%	+12%

During those years, Tennessee experienced an overall decrease in unemployment (see Table 5). This may have some impact on employment for the study participants.

Table 5: Tennessee annual average unemployment rate

1991	6.7%
1992	6.4%
1993	5.8%
1994	4.8%
1995	5.2%

Three attitudinal questions were asked about participants' perceptions of their jobs. Table 6 lists averages to these three questions for the 54 individuals who were employed at both baseline and follow-up. Those participants who were employed (N=54) reported an overall marginally significant ($p<.06$) increase in the perception of responsibility at work. There were no significant differences reported about satisfaction with present job and about the perception of a chance of promotion. So, while there is some increased sense of level of responsibility at work, people do not seem to feel that they have a chance for a "better" job.

Table 6: Employed participants' perceptions about present jobs

Questionnaire Items	Baseline (N=54)	Follow-up	Significance test results
I have a lot of responsibility at work (scale from 1 "Strongly disagree" to 5 "Strongly agree")	4.02	4.30	t-test p<.06
☐ Participants with fewer than 80 hours	4.03	4.13	Interaction
☐ Participants with 80 or more hours	4.10	4.55	n.s.
I am satisfied with my present job (scale from 1 "Strongly disagree" to 5 "Strongly agree")	3.76	3.83	t-test, n.s.
☐ participants with fewer than 80 hours	3.91	3.97	Interaction,
☐ participants with 80 or more hours	3.50	3.55	n.s.
With my present skill level, I have no chance for promotion (scale from 1 "Strongly agree" to 5 "Strongly disagree")	2.48	2.74	t-test, n.s. Interaction,
☐ participants with fewer than 80 hours	2.55	2.74	n.s.
☐ participants with 80 or more hours	2.33	2.57	

Self-esteem

Increased self-esteem is often reported by participants as an important outcome of basic education programs. According to Beder (1998) of all the

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studies he surveyed of adult basic education students that included variables of self-esteem, self-concept, or self-image, none found declines in these variables, and most found quite large gains. Almost all studies Beder reviewed (except the Tennessee Longitudinal Study) used only measures of self-report for self-esteem.

The instrument used to examine self-esteem in the Tennessee study was Rosenberg Self-Esteem Scale, selected in part because it has been widely used with different populations and in part because it is one of the shorter self-esteem instruments. Several studies among different populations support validity and reliability of this instrument (Bagley, Bolitho, and Bertrand, 1997; Hagborg, 1993; and Wallace, 1988); however, its use with ABE students has not been tested. The instrument has a 4-point "Strongly agree - Strongly disagree" scale with 10 items. For the Longitudinal Study, an "Undecided" mid-point on the scale was added. A reliability analysis was conducted on this revised scale, using all participants who completed the baseline interviews. For N=438, this ten-item scale yielded a Cronbach alpha of .78, well within reliability estimates reported in other studies. Figure 2 presents the scale used in the Longitudinal Study.

Figure 2: Modified Rosenberg Self-Esteem Scale used in the study
(scores in parentheses; higher score indicates more self-esteem)

Questions	SA (strongly agree)	A (agree)	UN (undecided)	D (disagree)	SD (strongly disagree)
On the whole I am satisfied with myself	(5)	(4)	(3)	(2)	(1)
At times I think I am no good at all	(1)	(2)	(3)	(4)	(5)
I feel that I have a number of good qualities	(5)	(4)	(3)	(2)	(1)
I am able to do things as well as most other people	(5)	(4)	(3)	(2)	(1)
I feel I do not have much to be proud of	(1)	(2)	(3)	(4)	(5)
I certainly feel useless at times	(1)	(2)	(3)	(4)	(5)
I feel that I'm a person of worth at least on an equal level with others	(5)	(4)	(3)	(2)	(1)
I wish I could have more respect for myself	(1)	(2)	(3)	(4)	(5)
All in all I am inclined to feel that I am a failure	(1)	(2)	(3)	(4)	(5)
I take a positive attitude toward myself	(5)	(4)	(3)	(2)	(1)

On the Rosenberg scale, there was significant increase in the longitudinal study participants' self-esteem one year after enrollment in literacy programs, as summarized in Table 7. There was no difference in self-esteem changes between participants with less than 80, and participants with 80 or more hours of instruction. These results suggest that for adults, taking the step to participate in ABE can lead to higher self-esteem. It should be noted that for study participants, self-esteem as measured by the Rosenberg was above the scale mid-point even at baseline. So, while self-esteem increased significantly after enrollment for the participants as a group, it was not particularly low at baseline.

Table 7: Differences in average self-esteem before and after enrollment in literacy programs

	Baseline	Follow-up	Significance test results
All participants (N=199)	3.52	3.66	t-test $p<.01$
Those with <80 hours	3.50	3.61	Interaction n.s.
Those with 80+ hours	3.57	3.76	

Civic Life

Several items in the questionnaire targeted community awareness and involvement. Distinction is made between these two areas; "involvement" means the participants' community- and citizenship-related actions and activities, and "awareness" means the degree of their perceptions of and interest in the communities they live in.

Community involvement

In the area of community involvement, there were changes in the number of participants registered to vote. At the baseline, 108 people said they were registered to vote, and 90 people said they were not. One year after enrollment, 122 said they were registered to vote, and 76 said they were not. Although these results are only marginally significant, this still is a substantial (14 people) increase in numbers.

Table 8: Number of participants registered to vote before and after enrollment in literacy programs

Are you a registered voter? (N = 198)	Baseline	Follow-up	Significance test results
◤ yes ◤ no	55% (108) 45% (90)	62% (122) 38% (76)	Chi-square P<.06

In three questions participants were asked whether they were involved in community organizations. There were significant changes in the percentage of participants who reported some activity in the three areas of community involvement (Table 9).

Table 9: Involvement in community organization before and after enrollment in literacy programs

Organization	Baseline	Follow-up	Significance test results
Church/Synagogue	N = 169		Chi-square p<.05
Don't belong Some activity	38% 62%	30% 70%	
PTA/PTO	N=145		Chi-square p<.05
Don't belong Some activity	84% 16%	77% 23%	
Social/Sports	N=147		Chi-square p<.05
Don't belong Some activity	93% 7%	83% 17%	

Although overall levels of participation in PTA/PTO and social/sport organizations remain relatively low, the significant increase in numbers suggests that civic involvement can be considered one of the outcomes of literacy programs. However, many other aspects of community involvement remained unchanged (Table 10).

Table 10: Other aspects of community involvement measured before and after enrollment in literacy programs (N=189)

How often do you...?	Baseline	Follow-up	Significance test results
Attend community meetings (scale from 1 "Never" to 4 "Regularly")	1.65	1.67	t-test, n.s.
• participants with fewer than 80 hours	1.52	1.65	Interaction
• participants with 80 or more hours	1.91	1.70	$p<.07$
Talk politics with friends and family (scale from 1 "Never" to 4 "Regularly")	2.06	2.13	t-test, n.s.
• participants with fewer than 80 hours	2.14	2.10	Interaction,
• participants with 80 or more hours	2.18	2.05	n.s.

Participants with fewer than 80 hours tended, one year after enrollment, to attend slightly more community meetings, while participants with more than 80 hours attended fewer community meetings. There were no significant differences between baseline and follow-up on responses to other community-related items. However, we believe that increases in voter registration and in activity in community organizations show that these changes may be outcomes of participation in literacy programs.

Community awareness.

No significant differences were found in the area of community awareness, with one exception where marginal ($p<.09$) interaction effect was found: participants with fewer than 80 hours tended one year after enrollment to agree more with the item "Public officials don't show enough concern for ordinary people," while people with more than 80 hours tended to agree less with this item (Table 11).

Overall, this study suggests that one year after enrollment in literacy programs, participants' community involvement changed more than their community awareness. Perhaps, for some of them, enrollment in ABE was the first step to interest and participation in new activities. The lack of changes in community awareness could be partially explained by the "traditional" curriculum in literacy programs, the content of which has little to do with local communities.

Table 11: Community awareness measured before and after enrollment in literacy programs (N=189)

Questionnaire item	Baseline	Follow-up	Significance test result
Public officials don't show enough concern for ordinary people (scale from 5 "Strongly agree" to 1 "Strongly disagree")	3.89	3.71	t-test n.s.
☐ participants with fewer than 80 hours	3.81	3.96	Interaction
☐ participants with 80 or more hours	4.05	3.92	p .09
My community does not have good quality public schools (scale from 1 "Strongly agree" to 5 "Strongly disagree")	3.20	3.25	t-test, n.s.
☐ participants with fewer than 80 hours	3.16	3.20	Interaction,
☐ participants with 80 or more hours	3.30	3.34	n.s.
My neighborhood is a safe place to live (scale from 5 "Strongly agree" to 1 "Strongly disagree")	3.45	3.53	t-test, n.s.
☐ participants with fewer than 80 hours	3.58	3.58	Interaction,
☐ participants with 80 or more hours	3.28	3.50	n.s.
I am satisfied with my community (scale from 5 "Strongly agree" to 1 "Strongly disagree")	3.66	3.53	t-test, n.s.
☐ participants with fewer than 80 hours	3.73	3.59	Interaction,
☐ participants with 80 or more hours	3.59	3.61	n.s.
I worry about environmental problems in my community (scale from 5 "Strongly agree" to 1"Strongly disagree")	3.43	3.47	t-test, n.s.
☐ participants with fewer than 80 hours	3.36	3.43	Interaction,
☐ participants with 80 or more hours	3.53	3.52	n.s.
I am more interested in what goes on in my own community than in the rest of the world (scale from 1 "Strongly agree" to 5 "Strongly disagree")	2.71	2.84	t-test, n.s.
☐ participants with fewer than 80 hours	2.71	2.78	Interaction,
☐ participants with 80 or more hours	2.68	2.87	n.s.
I feel full of hope about the future (scale from 5 "Strongly agree" to 1 "Strongly disagree")	3.89	3.86	t-test, n.s.
☐ participants with fewer than 80 hours	3.89	3.81	Interaction,
☐ participants with 80 or more hours	3.98	4.00	n.s.
As a citizen I can bring about needed change in government (scale from 5 "Strongly agree" to 1 "Strongly disagree")	3.48	3.36	t-test, n.s.
☐ participants with fewer than 80 hours	3.45	3.33	Interaction,
☐ participants with 80 or more hours	3.50	3.35	n.s.

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Literacy Practices

Literacy practices are defined in this study as everyday life activities related to basic skills, the ability to read, write, and solve math problems. Changes/improvements in literacy practices are expected outcomes of participation in literacy programs. Overall changes in literacy practices one year after participants' enrollment in literacy programs were found, as well as some difference between those with limited and substantial levels of participation (Table 12).

There was a statistically significant ($p<.05$) decrease in participants' needs to memorize things because of inability to read well enough: from 2.99 to 2.60 on a 4-point scale (4 – "regular need to memorize," to 1 – "never need to memorize"). This difference was more pronounced in those with fewer than 80 hours of participation (from 3.17 to 2.60) than in those with 80 or more hours (from 2.71 to 2.67) suggesting that people who leave programs sooner may be doing so because they were able to partially meet some of their immediate reading goals. Other significant changes in literacy practices were reported: increased frequency of paying bills oneself and of working with numbers on the job. Increase in frequency of using the public library also approached the significance level.

Out of the three significant areas of changes, two were related to applying math skills, and one indicated improvement of memorization. In the four areas where reported changes were non-significant, two were job-related, and two had to do with reading skills.

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Table 12: Changes in literacy practices before and after enrollment in literacy programs

"How often do you...?"	Baseline	Follow-up	Significance test results
pay bills yourself (scale from 1 "Never" to 4 "Regular")	3.25	3.45	t-test p<.05
☐ participants with fewer than 80 hours	3.15	3.39	Interaction
☐ participants with 80 or more hours	3.41	3.59	n.s.
work with numbers on the job/ if applicable (scale from 4 "Never" to 1 "Regular")	2.37	1.78	t-test p<.05
☐ participants with fewer than 80 hours	2.26	1.77	Interaction
☐ participants with 80 or more hours	2.56	1.72	n.s.
need to memorize things because you can't read well enough (scale from 1 "Never" to 4 "Regular")	2.99	2.60	t-test p<.05
☐ participants with fewer than 80 hours	3.17	2.60	Interaction
☐ participants with 80 or more hours	2.71	2.67	p<.01
use the public library (scale from 1 "Never" to 4 "Regular")	1.86	1.97	t-test p<.08
☐ participants with fewer than 80 hours	1.79	1.84	Interaction
☐ participants with 80 or more hours	2.00	2.25	n.s.
read magazines, newspapers, or books (scale from 1 "Never" to 4 "Regular")	3.09	3.11	t-test, n.s.
☐ participants with fewer than 80 hours	3.02	3.12	Interaction,
☐ participants with 80 or more hours	3.17	3.17	n.s.
read books to your children/ if applicable (scale from 1 "Never" to 4 "Regular")	2.88	2.84	t-test, n.s.
☐ participants with fewer than 80 hours	2.79	2.85	Interaction,
☐ participants with 80 or more hours	2.92	2.68	n.s.
need to write on the job/ if applicable (scale from 4 "Never" to 1"Regular")	2.33	2.27	t-test, n.s.
☐ participants with fewer than 80 hours	2.29	2.16	Interaction,
☐ participants with 80 or more hours	2.47	2.58	n.s.
need to read to get your work done/ if applicable (scale from 4 "Never" to 1 "Regular")	2.40	2.25	t-test, n.s.
☐ participants with fewer than 80 hours	2.19	2.13	Interaction,
☐ participants with 80 or more hours	2.79	2.58	n.s.

Involvement with Children's Education

Involvement in the educational development of their children is one of the three goals of the recent Workforce Investment Act (1998). There were several items in the questionnaires that targeted participants' involvement in their young (under 18) children's education. One of the most interesting findings in this area was the discovery that participants at baseline reported that they were often involved in their children's educational activities (on all the related items, means are above the mid-points of scales from "Never" to "Often" or "Several times a year"). However, there was not a significant increase in involvement at follow-up. This may indicate that parents in this study shared the WIA goal of involvement before they began ABE. It should also be noted that they were not enrolled in family literacy programs.

Table 13: Involvement with children's schooling before and after enrollment in literacy programs (N = 67)

How often have you...?	Baseline	Follow-up	Significance test results
In the last month, helped the children with their schoolwork (scale from 1 "Never" to 4 "Often")	3.03	3.01	t-test, n.s.
☐ participants with fewer than 80 hours	2.95	2.87	Interaction,
☐ participants with 80 or more hours	3.04	3.08	n.s.
In the last month, talked with the children about school (scale from 1 "Never" to 4 "Often")	3.76	3.79	t-test, n.s.
☐ participants with fewer than 80 hours	3.78	3.73	Interaction,
☐ participants with 80 or more hours	3.73	3.85	n.s.
In the past year, visited or called teachers about the children's progress (scale from 1 "Never" to 3 "Four or more times")	2.24	2.28	t-test, n.s.
☐ participants with fewer than 80 hours	2.11	2.24	Interaction,
☐ participants with 80 or more hours	2.35	2.31	n.s.
In the last year, attended school activities other than sports (scale from 1 "Never" to 3 "Four or more times")	2.27	2.23	t-test, n.s.
☐ participants with fewer than 80 hours			
☐ participants with 80 or more hours	2.12	2.18	Interaction,
	2.50	2.25	n.s.
Tell your children stories (scale from 1 "Never" to 4 "Regular")	2.79	2.84	t-test, n.s.
☐ participants with fewer than 80 hours	2.78	2.85	Interaction,
☐ participants with 80 or more hours	2.63	2.71	n.s.

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While a substantial proportion of both groups agreed with the statement that "A book is a good gift for a child" (see Table 14). Participants with more than 80 hours tended to agree with this statement more one year after enrollment (increase from 4.38 to 4.67); there was no increase among those with fewer than 80 hours of participation (statistically significant interaction effect with $p<.01$).

Table 14: A book is a good gift for a child

Measured on a 5-point scale from 5 "Strongly disagree" to 1 "Strongly agree"	Baseline	Follow-up	Significance test results
All participants	4.45	4.54	t-test, $p<.05$
☐ participants with fewer than 80 hours	4.50	4.50	Interaction,
☐ participants with 80 or more hours	4.38	4.67	$p<.01$

There is a significant increase in the rate of agreement with this statement. It should also be noted that, as in many other items related to children's education, the baseline scores were quite high to begin with (in this case, 4.45 out of possible 5). Although increased involvement in children's education is often expected to be an outcome in participation in literacy programs, we did not find such changes, with an exception of this one item. We did find, however, that many participants already reported being involved in their children's education before they enrolled in ABE.

Life Satisfaction

The ultimate goal of any undertaking by a person may be to increase his or her quality of life and life satisfaction. Measuring subjective life satisfaction can complement objective measures of a person's quality of life, such as income, having access to healthcare, level of education, etc. The Life Satisfaction instrument used in the Tennessee Longitudinal Study was the Set of Domain Satisfactions developed by Campbell, Converse, and Rodgers (1976) and slightly modified for the study. Satisfaction with the 12 life domains and "life in general" (an item added for this study) was measured at the baseline and in follow-ups for Cohorts Two and Three on a 5-point scale, from 1 "Not good at all" to 5 "Very good." In the first year follow-up (Cohort One), a 3-point scale in which participants were asked to compare how they felt with the baseline year ("Same," "Better," and "Worse") was substituted for the original one. Therefore, results are summarized in two different tables. Table 15 presents responses for Cohort One.

Table 15: Life satisfaction before and after enrollment in literacy programs for Cohort One (N=69)

How do you feel about...?	Same	Worse	Better
Your house or apartment:	45%	7%	48%
The city or neighborhood where you live	58%	9%	33%
Our national government	66%	17%	17%
Your non-working activities, hobbies, etc.	41%	6%	38%
Your religion	51%	3%	32%
Organizations you belong to	52%	3%	14%
Your family life	41%	1.5%	45%
Your friendships	49%	6%	33%
Your financial situation	39%	20%	29%
Your life in general	35%	3%	51%
Your work (if employed, N=31)	29%	3%	68%
Your marriage (if married, N=28)	50%	7%	43%
Your health/ physical condition	54%	9%	26%
Your child's school performance? (N=28)	39%	0%	61%

Statistical tests are difficult to perform on these data since there are no direct comparison questions. Participants were asked at the time of the follow-up to report on a subjective experience of life satisfaction. A t-test analysis is not appropriate, given the lack of interval data. A chi-square analysis is also difficult since there is no clear recognition of what the expected values for a comparison would be. Should equal number of participants have been expected in all categories at follow-up (that is, one-third same, one-third better, one-third worse)? Clearly, there is no rationale for this expectation. Should most participants have been expected to report that their experiences were the "same" one year later? This expectation also does not have clear theoretical support. Therefore, the data in this table will be interpreted subjectively.

More than a half of the first Cohort participants reported feeling better about their work, their children's school performance, and their life in general. In

several areas, their feelings remained largely the same: community, national government, religion, organization they belonged to, their health, and marriage. They had mixed feelings about their financial situation (the only item, along with the "national government," about which more than 10% of participants felt worse one year after the baseline survey).

After the first Cohort One follow-up, the baseline Life Satisfaction instrument was used again for follow-ups. It is possible to statistically analyze these data. Table 16 presents results for Cohorts Two and Three. Participants in Cohorts Two and Three reported significantly increased satisfaction about their financial situation after participation in literacy programs. Those with 80 or more hours of participation reported increased satisfaction with their family life and marriage to a larger degree than those with fewer than 80 hours. In fact, in the areas of marriage and family life, those with fewer than 80 hours reported slightly (although not statistically significantly) decreased satisfaction.

Table 16: Life satisfaction before and after enrollment in literacy programs for Cohorts Two and Three (N = 120)

How do you feel about ...? (on a 5-point scale, from 1 "Not good at all" to 5 "Very good"	Baseline	Follow-up	Significance test results
Your financial situation	2.61	2.87	t-test, p< .05
☐ participants with fewer than 80 hours	2.51	2.78	Interaction
☐ participants with 80 or more hours	2.71	3.19	n.s.
Organizations you belong to	3.80	3.77	t-test, n.s.
☐ participants with fewer than 80 hours	3.44	3.48	Interaction
☐ participants with 80 or more hours	4.50	4.13	n.s.
Your family life	4.23	4.11	t-test, n.s.
☐ participants with fewer than 80 hours	4.38	4.01	Interaction p< .05
☐ participants with 80 or more hours	4.03	4.43	
Your marriage (if married)	4.55	4.47	t-test, n.s.
☐ participants with fewer than 80 hours	4.68	4.41	Interaction p< .07
☐ participants with 80 or more hours	4.17	4.58	
Your house or apartment:	4.26	3.94	t-test, n.s.
☐ participants with fewer than 80 hours	4.52	3.90	Interaction,
☐ participants with 80 or more hours	3.81	4.13	n.s.
The city or neighborhood where you live	3.48	3.71	t-test, n.s.
☐ participants with fewer than 80 hours	3.56	3.66	Interaction,
☐ participants with 80 or more hours	3.31	3.84	n.s
Our national government	2.79	2.92	t-test, n.s.
☐ participants with fewer than 80 hours	2.77	2.94	Interaction,
☐ participants with 80 or more hours	2.75	2.91	n.s.
Your non-working activities, hobbies, etc.	3.98	3.89	t-test, n.s.
☐ participants with fewer than 80 hours	4.07	3.86	Interaction,
☐ participants with 80 or more hours	4.00	4.17	n.s.
Your religion	4.19	4.28	t-test, n.s.
☐ participants with fewer than 80 hours	4.26	4.27	Interaction,
☐ participants with 80 or more hours	4.14	4.14	n.s.
Your friendships	4.16	4.25	t-test, n.s.
☐ participants with fewer than 80 hours	4.34	4.25	Interaction,
☐ participants with 80 or more hours	4.00	4.43	n.s.
Your life in general	3.98	3.97	t-test, n.s.
☐ participants with fewer than 80 hours	4.08	3.87	Interaction,
☐ participants with 80 or more hours	3.87	4.16	n.s.
Your work (if employed)	3.97	3.82	t-test, n.s.
☐ participants with fewer than 80 hours	4.05	3.86	Interaction,
☐ participants with 80 or more hours	4.10	3.70	n.s.
Your health/ physical condition	3.71	3.52	t-test, n.s.
☐ participants with fewer than 80 hours	3.72	3.54	Interaction,
☐ participants with 80 or more hours	3.74	3.48	n.s.

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Conclusions/Implications

This section summarizes the findings of this report and examines the implications for adult basic education. The Longitudinal Study of Adult Literacy Participants in Tennessee asked people enrolling in beginning level adult basic education programs questions about various aspects of their lives. The designers of the study hoped to identify changes in the lives of the participants occurring after their enrollment in adult basic education. A number of changes were found from the responses of 199 people re-interviewed approximately one year after their initial enrollment. These changes include:

- An increase in rate of employment from 32% to 48%.
- An overall increase in self-esteem as measured by the Rosenberg Self-Esteem Scale from 3.52 to 3.66 on a 5 point scale ($p<.01$).
- Increased involvement in community (religious, PTA, social/sports) organizations ($p<.05$).
- Positive changes in three of eight literacy practices examined (paying bills, working with numbers on the job, needing to memorize because of limited reading ability ($p<.05$).
- Increase in number of people who thought a book was a good gift for a child ($p<.05$).
- An increased overall satisfaction with their financial situation in Cohorts 2 and 3 ($p<.05$).

There was positive change on at least one item in each category examined by this study -- employment, self-esteem, community, and children's education. It should be noted that there was not a control group in this study, and so one cannot say that these changes were a result of the enrollment of the participants in an adult literacy class. But the changes were greater than would be expected by chance, and the common variable among the participants (in addition to being Tennessee adults) was enrolling approximately one year earlier in an adult literacy program.

However, there were no significant changes in some areas. No significant changes were found in community awareness or in how people felt about their community. People were not more likely to attend community meetings or talk politics. There was not a significant increase in reading reported, nor a significant increase in involvement in children's education. There were few significant changes in life satisfaction.

The analysis for this report also compared the 32% of the group (N=60) with substantial participation (at least 80 hours of class since enrollment) with the 68% (N=129) with limited participation (fewer than 80 hours.) There were few significant differences between those with limited hours of classroom time and those who had substantial participation. Those with substantial participation did report significantly more satisfaction with their family life than those with fewer than 80 hours. Those with substantial participation were more likely to say that a book is a good gift for a child. On the other hand, those with limited participation were more likely to report a decrease in their need to memorize because they couldn't read well than were those with substantial participation. There was an increase of 18.5% in employment of those with limited participation compared to an increase of 12% in employment in the group with substantial participation.

To understand what these findings mean for adult basic education beyond the reassurance that even limited participation seems to lead to some positive changes in participants' lives, detailed program information is needed. What were the curricula, the instructional processes, the goals of the ABE programs that participants attended? Because only one of the program case studies that were part of the original design was conducted, these questions cannot be answered with real confidence. However the one case study (Crosse, 1994) and qualitative interviews with ten of the participants of the Longitudinal Study who were in seven of the programs (Bingman and Ebert, in press) provide a picture of what these programs offered. Those ten participants and the case study described programs where the teachers were very supportive and the curriculum was primarily structured around basic skills acquisition and practice. These were not family literacy programs. Nor were they community-based programs with a focus on civic involvement. So it is not surprising that this study found little change in community awareness and involvement. Likewise, the small changes in involvement of participants with their children's education are not surprising.

But there was a significant increase in employment even though the programs did not emphasize workforce development. Perhaps taking the step to enroll in an adult education program and improving reading and math skills, at least to some extent, led people to take the additional step of seeking employment. Perhaps taking the step to enroll led to increased self-esteem, and that influenced employment. Another possibility is that people enrolled in the programs with a goal of getting a job.

The analysis reported here supports the conclusion that participation in adult basic education is a positive factor in regard to employment. And it supports the often-reported (Beder, 1991; Beder, 1998) conclusion that participation in adult basic education leads to increased self-esteem. Although positive changes found in self-esteem, literacy practices, and community involvement were not

large, it should be noted that small changes after a short period of association with an ABE program could lead over time to much greater impacts. For example, increased frequency of paying bills reported by some participants provides them with additional practice of basic skills that, combined with other new activities, can eventually lead to more confidence in one's ability to read and write.

This was a study conducted in Tennessee in the early 1990s. At that time, Tennessee spent an average of $194 annually per adult student (Tennessee Adult Education 1992 Status Report), there was limited interagency cooperation, the focus of instruction was on academic skills, and intensity of instruction was limited. In those circumstances the study found important changes in the lives of participants in beginning literacy programs. Today expenditures are greater, agencies cooperate in provision of instruction and services, curricula include a focus on family literacy and workplace skills, and many adult basic education students have access to twenty hours a week of instructional time. In today's circumstances, adult students may well report more changes in everyday life than when the longitudinal study was conducted. Improved data management systems and increasing understanding of and commitment to documenting outcomes should enable adult education programs to provide evidence of these changes.

However, if stakeholders in the adult basic education system have expectations for outcomes beyond basic skill acquisition, this study indicates the need for increased support for these outcomes. The limited changes this study found in literacy practices, in community awareness, and in involvement in children's education imply the need for modifications in adult literacy programs if these changes are indeed goals. An increased focus on community issues, family literacy, and everyday literacy uses in ABE classes are indicated if goals for ABE include changes in these areas of adult students' lives.

While new research (including a longitudinal study being conducted by the National Center for the Study of Adult Learning and Literacy (NCSALL) in Oregon) and documentation might open possibilities for assessment of outcomes of current adult literacy programs, there are also questions that could be addressed from additional analysis of the data from the Tennessee Longitudinal Study of Adult Literacy Participants. Analysis of the follow-up interviews conducted two and three years after enrollment, while of many fewer subjects, might yield new understandings of longer-term changes. A more detailed analysis of the descriptive baseline data could be compared to data on current adult education populations, populations affected by welfare reform. Questions that were discarded for this report (mainly because of the inconsistencies in questionnaires from year to year), for instance on health status, might yield interesting findings. The Center for Literacy Studies hopes that researchers will use the data sets generated by this study.

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National Center for the Study of Adult Learning and Literacy

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NCSALL is a collaborative effort between the Harvard Graduate School of Education and World Education. The Center for Literacy Studies at The University of Tennessee, Rutgers University, and Portland State University are NCSALL's partners. NCSALL is funded by the U.S. Department of Education through its Office of Educational Research and Improvement (OERI) and OERI's National Institute for Postsecondary Education, Libraries, and Lifelong Learning.

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